The only corrective of immoral publications of this description is to be found in reproducing them before public opinion of another kind from that of the unfortunates whose eyes alone they are intended to meet; and it is partly this consideration that has led us to review Mr. Yorke's essay, which, although excellent in itself, is hardly in close enough contact with natural science to demand notice in these pages.

GEORGE J. ROMANES

OUR BOOK SHELF

Iconographie der schalentragenden europäischen Meeres-conchylien. Von Dr. W. Kobelt. 4to. Heft 1. (Cassel: Theodor Fischer, 1883.)

THE object of this work is to supply a want which is continually felt by conchologists, and it deserves the greatest success. Dr. Kobelt is well known to science as the editor of the *Jahrbucher* and *Nachrichtsblatt der deutschen Malakozoologischen Gesellschaft*, which has now been published for between fifteen and sixteen years, and as one of the editors of the new *Conchylien-Cabinet* of Martini and Chemnitz; and he is also the author of several works and papers on conchological subjects. It appears from the prospectus of the present work that its scope will be confined to the coasts of Europe, including the English Isles, the Faroes, and Scotland, and bounded by the north coast of Africa, but excluding not only tropical and subtropical species of Mollusca, but those Arctic species from Spitzbergen and the north of Iceland which are not found on the coasts of Upper Norway. This scope, although extensive, is not very definite; and it scarcely accords with our usual notion of the European seas. We do not know what may be the author's limit of depth, whether it is the line of soundings or 100 fathoms; nor whether he will even take the Mollusca now about to be published from the *Triton* cruise between the Faroes and Scotland. The expeditions of the *Josephine*, *Lightning*, *Porcupine*, *Challenger*, *Vöringen*, *Travailleur*, *Washington*, *Knight Errant*, and several others, have of late years done much to aid in the exploration of the European seas at various depths; and the number of species thereby added to the Mollusca has been very considerable and is still increasing. Some additions have likewise been made from time to time to the Mediterranean Mollusca, especially by myself during the present month. Taking into account all these discoveries, I am inclined to reckon the number of species hitherto described as inhabiting the littoral zone and moderate depths in the European seas as not less than 1000; probably 1200 would be nearer the mark.

The first part of the present work, which has now appeared, gives figures of four species only and their varieties, one of which species (*Murex gibbosus*) is Senegalese, and has never (to the best of my knowledge and belief) been found in any part of the European seas. This reduces the number of figured species to 3. Perhaps the species will not be so profusely illustrated in the next and following parts. The published prospectus does not give any idea of the extent of the work. But assuming even that twenty species (large and small) may on an average be figured in each part, the entire work would take not less than from fifty to sixty parts, and would cost for an uncoloured copy 10*l.* to 12*l.*, and for a coloured copy 15*l.* to 18*l.* If all the species known to inhabit the European seas, including the abyssal and benthal zones, are to be figured—and I think this ought to be done—the extent and cost of the publication must be increased by probably a fourth more.

However, such calculations have doubtless been considered by the author or his publisher. The work will assuredly be far more scientific and valuable than the very irregular but expensive *Conchologia Iconica* of the late Mr. Reeve, and be not merely an "ouvrage de luxe."

The family *Muricidæ*, which is the first selected for publication, does not seem to be placed in the usual order of classification. All the figures are admirable. The descriptions are in Latin, the text in German. The geographical, hydrographical, and geological distribution, as well as the odontophore and synonymy, are carefully worked out.

J. GWYN JEFFREYS

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Sand

I HAVE recently been favoured with a reprint of Mr. J. G. Waller's paper upon sand, read before the Quekett Microscopical Society. The subject is so full of interest that I trust I may be allowed to give it a wider publicity in your columns. To render the study of practical use to geologists and physicists, the first step appears to me to ascertain whether it is possible to distinguish with certainty, by aid of the microscope, sand that has been worn by action of wind from sand that has been for long exposed to surf, and this again from sand brought down by torrents. The degree of rounding and the average size of the grains would be, I presume, among the chief characteristics, and it is to be hoped that naturalists abroad will kindly forward examples of undoubted blown and torrential sand, so that this point at least may be settled.

If it should prove that the origin of sand can be pronounced upon with any degree of certainty, from a microscopical examination, we should come into possession of a most valuable aid to the study of at least Tertiary geology. It is well known that marine and freshwater deposits succeed each other repeatedly throughout our Eocene formations, and where deposits of sand are in juxtaposition, it is at present impossible to draw any line between them. It is only possible to surmise that they are of different origin and therefore age, when pebble or oyster beds on the one hand, or films of clay with plant impressions on the other, are accidentally included in them. So far as our own Eocenes go, it appears from Mr. Waller's results that their sands, when of marine origin, possess a percentage of flint grains, but that purely fluviatile sands do not possess any. Marine and freshwater sands are in direct contact in very many of our Eocene sections, and I hope Mr. Waller's researches will enable us to distinguish them and apportion the proper thickness to each.

With regard to the relative rarity of flint-grains and preponderance of quartz, in all the Tertiary and recent sands hitherto examined, it appears just possible that the concussion the flint grains must undergo when beaten for ages in the surf, might induce a molecular change from the colloid to crystalline state, but in the absence of any fact or argument to support such a theory it cannot be seriously entertained. It is however possible that quartz grains reach a final state of subdivision, and then suffer relatively little by attrition, and are therefore almost indestructible, while flint grains become rapidly degraded into mud. This appears to be very much the opinion Mr. Waller has formed. It does seem at first sight matter for surprise that the grinding of flint should not more largely affect the composition of our sea sand; but we must on the other hand reflect on the indestructible nature of the quartz grains that chiefly compose it, that it may have been accumulating since palæozoic times, and the enormous bulk of the quartzose rocks that must have been ground down to supply it during such vast ages, and then compare the sources with flints which in comparison only appeared yesterday, and then but as scattered segregations in a limited portion of a single formation. Flints and flint beaches, recent and ancient, are at our gates, and are continuously renewed by the wearing away of the chalk of which so much of our part of England is composed, and their aggregate mass therefore astounds us; but they after all occur over only a

limited area, and mostly in unconsolidatad beds, and it is quite probable that they would not outlast the destructive influences to which they are subjected if these were continued throughout a geological period. The coast-line occupied by flint-shingle is almost limited to portions of Western Europe, and is relatively insignificant. J. S. GARDNER

Science Club

The Great Comet *b* 1882

M. RAOUL GAUTIER, of Geneva, has recently published, in *Astronomische Nachrichten*, No. 2519, three sets of elements of this comet, calculated from a few observations before perihelion. He says that, as it is possible to represent with the same curve, either a parabola or an ellipse, the nearest observations before and after perihelion, he believes "que si la comète a subi une perturbation dans son mouvement lorsqu'elle a passé à son périhélie, cette perturbation a dû être insensible."

As I am not so far advanced with my calculations, for I have begun a thorough discussion of the movement of that comet, I do not know whether there has been or not any considerable perturbation during the passage near the sun; but can the simple fact alluded to by M. Gautier give us much information on that point?

In fact, we can easily understand that although the orbit after perihelion might be quite different from the orbit before that point, still the positions of the comet at a short distance from perihelion may be pretty well represented, within the limits of the errors of observations, by a single curve, which of course will be of second order, but which will not certainly give the calculated positions of the comet at a certain distance from perihelion agreeing with the observations. If we could prove that the orbits calculated, for instance, from observations between September 7 and 12 and between the 22nd and the 30th of the same month agree together, and give the positions of the comet immediately before and after perihelion according to the observations, then we could say that the movement of the comet was not perturbated during the passage near the sun. But this fact is not proved at all, and instead it seems that the passage through the corona has had some effect upon the movement of that remarkable comet. E. RISTORI

13, Pembridge Crescent, Bayswater, June 16

THIS comet was visible here with the naked eye up to February 28. I so saw it myself on the evening of that day. Owing partly to cloudy weather, partly to moonlight, I had not seen it for ten days or a fortnight previously, but found it on that evening with little difficulty and without any optical help. In my telescope (4-in.) it appeared, roughly, like a long, flat-sided, oval nebula, the central part of the major axis being the brightest of the whole. Two cloudy evenings intervened, and on the following night (March 3) I could not see it with the naked eye, even after finding it with the telescope and knowing exactly where to look, and though the optical condition of the air seemed the same. During April I saw it, with the same telescope, on sixteen evenings, cloudy weather and moonlight interfering on the others. In the present month (May) I saw it five times, that is, up to the 6th certainly, and I believe I saw it on the 9th, but decreasing visibility and increasing moonlight prevented verification. I have just received a somewhat larger instrument (5-in.), with which after the moon has passed I hope to see it again. A. S. ATKINSON

Nelson, N.Z., May 19

Sun Pillar seen in Jamaica

AT sunset on May 15 I saw for the first time in my life the phenomenon called the *Sun Pillar*. A few days later the mail-packet arrived from England, and in NATURE I found much correspondence on its appearance on April 6 at several places in England and Wales between Hull and St. David's.

Major Gibney's admirable description of its general appearance on April 6 (vol. xxvii. p. 605) was so fully confirmed on May 15 in Jamaica that a very brief description may here suffice.

At 6h. 30m. p.m. Kempshot mean time it appeared as a bright ray of light of a faint roseate hue, 2° in width and 30° in height above the horizon, vertical, but not passing through the sun. A rough sketch was made at the time, and the circles of the equatorial were afterwards employed to determine the azimuth of the point where the pillar cut the horizon. This was 70° from the north towards the west; and as the sun's azimuth was 69° at the same time, the pillar passed 1° to the west of the sun. In the sketch the pillar is represented as passing its own breadth to the west of the sun, but as the sun was then just below the horizon the former measure is likely to be more correct.

Now with regard to the nature of the phenomenon, it certainly was not the usual display of the zodiacal light. The light is here seen to perfection; every fine night when there is no moonlight the zodiacal light may be seen following the ecliptic from the one horizon to the other with but little variation, except perhaps as to the *gegenschein* or stronger illumination near the point in the heavens diametrically opposite to the sun. And so clearly is it seen, that some years ago I carefully measured its breadth at different distances from the sun, and so formed the following table:—

Ang. dist. from Sun.	Breadth of Z.L.	Ang. dist. from Sun.	Breadth of Z.L.
°	°	°	°
30	41·4	110	20·3
40	38·7	120	17·8
50	36·1	130	15·3
60	33·4	140	13·0
70	30·7	150	10·8
80	28·1	160	8·9
90	25·5	170	7·6
100	22·9	180	7·0

From various considerations based upon the figure corresponding to these measures I consider the zodiacal light a terrestrial phenomenon—rays of light are swept back from the sun, chiefly from the tropical parts of the earth, and tend to accumulate at the point in the heavens diametrically opposite the sun.

If there be any truth in this theory, the sun pillar may be a strong and comparatively local development of the same light; this is the only explanation I can give; the explanation given by Mr. G. J. Symons, the well-known meteorologist, "that it is merely a portion of a halo passing through the sun" (vol. xxviii. p. 7), will not apply to the Jamaica observation at all; the sky was far too pure and transparent at the time, and there was not the least trace of *cirrus* cloud. MAXWELL HALL

Kempshot Observatory, Jamaica, June 7

Error in Hutton's Tables of Logarithms

AT the end of Hutton's "Mathematical Tables" (new edition, 1858, Longmans and Co., London) there is a very useful table containing the logarithms of certain constants frequently used in calculation. The tropical revolution of the earth in days is there given as 365·24226, and the logarithm of this most important constant is given as 2·5625910 instead of 2·5625810.

I would be glad to know from any of your readers whether there are any other important errors in this edition, especially among those tables of logarithms in frequent use.

Jamaica, June 4 MAXWELL HALL

Palæozoic Sclerotic Plates

IN the course of my researches among the coal shales of Northumberland I discovered two specimens of ossicular rings known as sclerotic plates. The external diameter of one ring is five-eighths of an inch, and the orbital orifice is one-quarter of an inch; this ring of sclerotic plates consists of nine bones arranged as are the eye bones of Ichthyosaurus, Plesiosaurus, and eagles, viz. in tolerably uniform segments. The second specimen is a quadrant of a ring, and consists of six plates of larger size than the other specimen. I shall be glad to learn if any of your readers have discovered similar sclerotic plates in the Palæozoic rocks of the British Isles, as specimens are not exhibited in the British Museum, Jermyn Street Museum, or Edinburgh Museum. T. P. BARKAS

Newcastle-on-Tyne, June 25

Graft-Hybridisation

ST. PAUL, in his Epistle to the Romans, says (ch. xi. v. 17), in illustration of the admission of the Gentiles to the religious privileges of the children of Israel, "If thou, being a wild olive, wert grafted in among them, and didst become partaker with them of the root of the fatness of the olive tree," &c. Olshausen, in his commentary on this epistle, says (English translation, p. 369),